The invention relates to an improvement in caps for containers and more particularly to a cap for the dispensing of liquid from a container.

With a container mounting an overlapping having an outlet hole closeable by a solid nozzle closure pin, liquid is caused to spurt from the outlet hole when the pin is brought into full contact with the outlet hole for closure thereof. This is particularly true and highly undesirable when the container holds a low viscosity fluid such as lighter fluid used to light cigarettes, cigars, charcoal used for cooking and the like. The spur of excess fluid causes a mess, is odiferous and in some cases is a fire hazard.

It is an object of the invention to provide a cap which reduces to an absolute minimum the amount of fluid in excess at the outlet hole of the cap when the hole is closed off by the closure pin mounted on a nozzle. An applicant has accomplished by forming a relatively small orifice consisting of a small open channel longitudinally on the side of a closure pin which is moved into an outlet hole of an overcap, and when the channel is moved into a position whereby the channel is completely opposite the wall of the outlet hole, the channel is thereby cut off from communication with a hollow portion of the nozzle mounted in the outlet pin. A closing of the cap with the least amount of excess fluid is thus brought about by closing off a relatively small orifice. The problem of molding a small orifice without a core pin molding problem is accomplished by forming an open channel on the wall of a closure tip for coaction with the wall surface of a closure outlet hole in which the tip operates.

The orifice is opened by moving the closure pin downwardly of the outlet hole whereby the lower end of the channel is in communication with the hollow portion of the nozzle.

The channel together with a portion of the wall surface of the outlet hole form a small orifice, the diameter of which is difficult and costly to mold where it extends through a single piece of material. The construction of the channel and tip and the coaction of the wall of the outlet hole not only provides outlet means but also closure means for the cap.

It will not be here attempted to set forth and indicate all of the various objects and advantages incident to the invention, but other objects and advantages will be referred to in or else will become apparent from that which follows:

The invention will appear more clearly from the following detailed description when taken in connection with the accompanying drawings, showing by way of example a preferred embodiment of the inventive idea wherein like numerals refer to like parts throughout.

The drawings forming part of this application:

FIGURE 1 is a perspective view of the closure cap embodying the invention and shown in closed condition.

FIGURE 2 is an enlarged sectional view on the line 2—2 of FIGURE 1 with the cap in a fully open condition.

FIGURE 3 is an enlarged sectional view similar to FIGURE 2 with the nozzle in full line and the cap in a semi-closed condition, a portion of the nozzle being broken away.

FIGURE 4 is a further enlarged sectional view similar to FIGURE 3 with the cap in a fully closed condition.

FIGURE 5 is an enlarged top plan view of the inner nozzle with the overcap removed.

FIGURE 6 is a side elevational view of the inner nozzle with the overcap removed.

FIGURE 7 is a sectional view of a cap with the conventional cap closure tip in open position.

FIGURE 8 is a sectional view of a cap with a conventional cap closure tip in closed position, a spur of fluid illustrated as emanating from the tip as a result of the closure.

Referring to the drawings in detail the closure cap includes the nozzle which includes the hollow cylindrical base portion 28, the inner diameter of which is larger than the outer diameter of the cylindrical base 12.

The cylindrical base portion 28 terminates at its upper end in the external flange 30 which terminates in the hollow upper end 32. The overcap also includes the internal annular bead 34 formed at the upper inner end of the cylindrical base portion 28. The annular bead 34 has an inner diameter less than the outer diameter of the annular outer bead 24 whereby the bead 34 engages the annular outer bead 24 when the cap is placed in open condition as hereinafter described. The internal annular bead 34 terminates at its upper edge in the axially disposed cylindrical chamber 36 of the overcap, and the diameter of the chamber portion 36 of the overcap 26 is substantially that of annular outer bead 24 of the nozzle 10 whereby the overcap 26 may be reciprocally moved upon the nozzle.

The upward limit of travel of the overcap 26 upon the nozzle 10 is restricted by contact of the internal annular bead 34 with the outer annular bead 24 of the nozzle.

The cylindrical chamber 36 terminates at its upper edge in the cavity 38 which terminates at its upper edge in the axially disposed outlet hole 40. The closure pin is reciprocably movable in the outlet hole 40 as will be hereinafter described in detail to effect an opening and closing off of the cap.

The overcap 26 is reciprocally mounted on the nozzle by forcing the same downwardly upon the nozzle whereby the internal annular bead 34 of the overcap is forced over the annular outer bead 24 of the nozzle with the pin extending into the outlet hole 40, the bead 34 of the overcap engaging with the bead 24 of the nozzle to limit the travel of the overcap and create a positive open position of the cap.

With the overcap 26 in the fully closed position upon the nozzle, as shown particularly in FIGURE 4, the annular bead 24 of the nozzle abuts the lower edge of the cavity 38 so as to thereby defining the fully closed position with the pin 18 extending through the outlet hole 40 and the solid uninterrupted portion 21 of the pin in contact with the wall of the outlet hole. As a result,
there is no flow possible out of the outlet hole 40 for the channel 20 is completely out of register with the cavity 30. With the overlap 26 in a partially raised position, as in FIGURE 3, the solid uninterrupted portion 21 of the closure pin 18 is still in contact with the wall of the outlet hole and the outlet hole is thereby cut off and the cap is in a closed position. With the overlap 26 further raised to a point where the internal annular bead 34 of the overlap contacts the outer annular bead 24 of the nozzle 10, a portion of the channel 20 is inwardly off or below the upper limit of the cavity formation 35 thereby in register with and communicating with the hollow formation 30 and allowing a flow of material from the cylindrical base portion 12 through the openings 16 and out the outlet hole 10 via the channel 20, particularly as shown in FIGURE 2. The channel 20 together with a portion of the wall of the outlet hole 40 defines an orifice for material, particularly as shown in FIGURE 2.

To close the cap, the overlap 26 is forced downwardly upon the nozzle portion and as a result such initial movement forces some liquid present in the cavity 30 out through the outlet hole 40 but not in any appreciable amount for it can only exit through the relatively small orifice 40. After the initial movement of the overlap and upon further movement thereof, the solid portion 21 of the pin 18 comes opposite the wall of the outlet hole 40 and the channel 20 is thereby sealed off as particularly indicated in FIGURE 3. The overlap is then moved to the lowered and fully closed position of FIGURE 4. In closing the cap, the only liquid that can possibly be caused to spurt from the outlet hole 40 is the small amount that had been contained in the channel 20 as the bottom of the channel reached the inwardmost edge of the outlet hole 40 as at 23. There is thus provided a restricted cut-off or closing of the outlet hole 40.

With a cap having a solid closure pin adapted to enter an outlet hole from a position fully removed from the hole, fluid is forced in a spur out the entire outlet hole until the pin actually enters the outlet hole, said type of cap illustrated in particular in FIGURES 7 and 8. More specifically, in FIGURE 7 the old type of cap is shown in open position and when the closure pin is moved to a closed position as in FIGURE 8, the full brunt of the upper end of the pin pushes liquid out of the outlet hole as illustrated in FIGURE 8.

With applicants' invention, a small orifice is produced in a manner which obviates the difficulties of molding a small orifice through a single piece of material. With the construction not only is a small orifice created but in co-action with the wall of the outlet hole, the orifice provides a valve for opening and closing the cap.

The invention is not to be understood as restricted to the details set forth since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A closure cap for a container comprising:
   (a) a nozzle having
   (b) a passageway for the flow of material therethrough and
   (c) a closure pin having a constant diameter and mounted on the upper end thereof,
   (d) said pin having a channel formed therein longitudinally along a portion of the outer surface thereof and extending to the outer free end thereof,
   (e) an overlap having an upper end and a hollow portion and mounted on said nozzle for reciprocal movement thereof,
   (f) said upper end of said overlap having an outlet hole communicating with said hollow portion and into which said closure pin extends with the lower end of said channel extended into said hollow portion in communication therewith thereby forming an orifice to allow flow of material through said channel and outlets when said overlap is moved in one direction upon said nozzle, said channel of a length to extend entirely into said outlet hole and out of communication with said hollow portion of said overlap when said overlap is moved in the opposite direction upon said nozzle thereby preventing flow of material through said channel and outlet hole.

2. A closure cap for a container comprising:
   (a) a nozzle having
   (b) a passageway for the flow of material therethrough and
   (c) a closure pin having a constant diameter and mounted axially on the upper end thereof,
   (d) said pin having a channel formed therein longitudinally along a portion of the outer surface thereof and extending to the outer free end thereof,
   (e) an overlap having an upper end and a hollow portion and mounted on said nozzle for reciprocal movement thereof,
   (f) said upper end of said overlap having an outlet hole formed axially therein and communicating with said hollow portion and into which said pin extends with said channel of a length to extend entirely into said outlet hole and out of communication with said hollow portion of said overlap when said overlap is moved in one direction upon said nozzle, said channel of a length to extend entirely into said outlet hole and out of communication with said hollow portion of said overlap when said overlap is moved in the opposite direction upon said nozzle thereby preventing flow of material through said channel and outlet hole.

3. A closure cap for a container comprising:
   (a) a nozzle having
   (b) a passageway for the flow of material therethrough and
   (c) a closure pin having a constant diameter and mounted on the upper end thereof,
   (d) an overlap having an upper end and a hollow portion and mounted on said nozzle for reciprocal movement thereof.

4. A closure cap for a container comprising:
   (a) a nozzle having
   (b) a closure pin having a constant diameter and mounted on the upper end thereof,
   (c) an overlap having
   (d) an upper end
   (e) formed with an outlet hole and mounted on said nozzle for reciprocal movement thereof,
   (f) said pin having a channel formed therein longitudinally along a portion of the outer surface thereof and extending to the outer end of the pin, said channel and wall of said outlet hole defining an orifice leading from said nozzle and said overlap when said overlap is moved in one direction on said nozzle, said channel of a length to extend entirely into said outlet hole and out of communication with said nozzle and overlap when said overlap is moved in the opposite direction on said nozzle thereby preventing flow of material through said channel and outlet hole.
5. A closure cap for a container comprising:
(a) a nozzle having
(b) a closure pin having a constant diameter and mounted on the upper end thereof
(c) an overcap having
(d) an upper end
(e) formed with an outlet hole and mounted on said nozzle for reciprocal movement thereon,
(f) means for limiting the reciprocal movement of said overcap on said nozzle,
(g) said pin having a channel formed thereon longitudinally thereof along a portion of the outer surface thereof and extending to the outer end of the pin, said channel and wall of said outlet defining an orifice leading from said nozzle and said overcap when said overcap is moved in one direction of said nozzle, said channel of a length to extend into said outlet hole and out of communication with said nozzle and overcap when said overcap is moved in the opposite direction on said nozzle thereby preventing flow of material through said channel and outlet hole.

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